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125

CACTUS AND SUCCULENT JOURNAL

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Of America

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FIG. 92. The size of a *Trichocereus Spachianus* flower is shown by Master Haselton. See pg. 136.



CACTUS AND SUCCULENT JOURNAL

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Vol. XX

SEPTEMBER, 1948

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ANNUAL MEETING

The annual meeting of the Cactus and Succulent Society of America, Inc., will be held at 2:00 P.M., Sunday, Sept. 19, at Johnson's Cactus Gardens, 16613 So. Garfield Ave., Paramount, Calif. (formerly Hynes). All members should come to meet old friends and to make new ones. There will be a door prize and also gift for each member and visitor who attends. Cold drinks will be served. This is an ideal time to combine a trip to see this beautiful, large nursery, completely devoted to the raising of cacti and other succulents, with your attendance at the Society's annual meeting.

ETHEL RUSH, Secretary.

FROM MEXICO

Mrs. Schmoll reports that she has taken back the management of Fernando Schmoll gardens and is now in a position to serve her old customers. Exports to the U.S.A. are open again and there should be less delays in orders.

HAWORTHIA NAMES

Following are the names of the plants shown in the group of Haworthias on page 25 of the February issue of this JOURNAL: Top picture, upper row—*H. fasciata*, *H. truncata*, *H. aristata*; lower row—*H. turgida* v. *erecta*, *H. setata* v. *Bijiliana*, *H. Hurlingii*. Bottom picture, upper row—*H. variegata*, *H. turgida*, *H. luteorosea*; lower row—*H. marumiana*, *H. Schuldtiana*.

A New Variety of *Mammillaria Scrippsiana*

By ROBERT T. CRAIG AND E. YALE DAWSON

Mammillaria Scrippsiana was described from material collected by J. N. Rose in the "Barranca of Guadalajara, Jalisco." Lacking more precise identification of the type locality, one may assume that it lies to the west of Guadalajara in one of the arid ranges in the direction of Autlan or Colima. Since Rose's route was probably by rail to Colima, his collections may have come from a region somewhat south of that from which the present material originated. Although our specimen is readily identified broadly with

M. Scrippsiana, a number of differences are apparent which indicate that a varietal status is desirable for recognition of the present entity. Accordingly, the plant described by Britton and Rose (Cactaceae 4:84, 1923) should be known as *Mammillaria Scrippsiana* (B. & R.) Orcutt var *typica* nom. nov. The new variety *autlanensis* var. nov. may be distinguished from the variety *typica* according to the following characteristics.

	var. <i>typica</i>	var. <i>autlanensis</i>
Habit:	solitary or?	solitary to clumping with 25 or more heads
Central spines:	2	1
Radial spines:	8-10	6
Stigma lobes:	cream colored	pale green

Since the original description of *Mammillaria Scrippsiana* is rather incomplete, it seems well to give here a fuller description of the new variety than might otherwise be called for.

Body simple or branched from the base and

lower sides of the body to form clumps of 25-30 heads; individual heads to 8.5 cm. diam., to 20 cm. high; tubercles arranged in 8 and 13, also 13 and 21 spirals, with very conspicuously woolly axils; central spines 1, 9-12 mm. long,

slender-subulate, straight or very slightly curved, yellowish brown, porrect; radial spines 6, 3-10 mm. long, acicular to slender-subulate, pale straw colored; flowers appearing from April to June in cultivation, wide funnelform, 11 mm. long, 13 mm. wide; outer perianth-segments with greenish-tan mid-stripe above to nearly white below, lanceolate, with acute tips and long-ciliated margins; inner perianth-segments with deep pink mid-line which is darker to nearly magenta ventrally, with pale pink margins, spatulate, with obtuse tips and serrated margins; anthers light orange-tan; filaments white to very pale pink above; style white; stigma lobes 5, pale green, 1 mm. long.

Varietati typicae similis at caespitosa, 25-cephala vel ultra; caudicibus 8.5 cm. crassis, ad 29 cm. altis, aculeis minus numerosis; aculeo centrali unico, radialis 6; stigmatis cruribus 5 pallide viridibus.

TYPE: Dawson 4924, on cliffs and slopes of igneous hills near the top of the pass on the road to La Resolana, southwest of Autlan, Jalisco, Mexico, December 26, 1946. (Allan Hancock Herbarium No. 22405.)¹ Figs. 1-2.

¹The material was collected on an expedition sponsored jointly by the John Simon Guggenheim Foundation and the Allan Hancock Foundation.

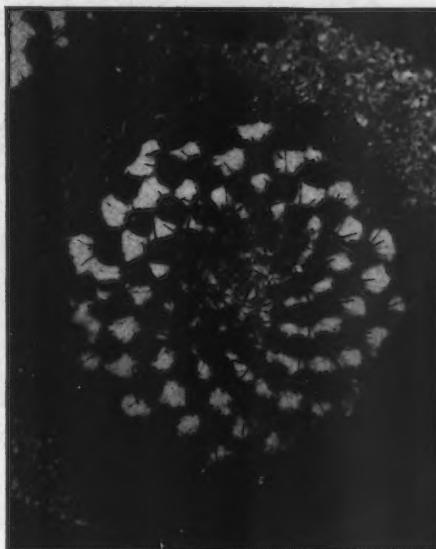


FIG. 93.

Photograph of the type specimen of *Mammillaria Scrippsiana* var. *autlanensis* var. nov. in cultivation. This plant has been permanently preserved in liquid in the Allan Hancock Herbarium.



FIG. 94.

Habit photo of a group of clumping plants of *Mammillaria Scrippsiana* var. *autlanensis* var. nov. at the type locality. Although the plants shown are growing on a grassy hillslope, others in the same area occur on rocky cliffs.

FIG. 95. Typical *Loxanthocereus* flower, x 1.

A KEY TO SOME OF THE PERUVIAN GENERA

By JOHN AKERS

All photos taken by the author while in Peru.

A. Flowers noticeably zygomorphic and usually enduring for a period of 48 hours or more.

B. Tube "S" shaped.

1. Perianth segments remaining nearly closed to form a tubular flower with a greatly exserted style (a) *Cleistocactus*
2. Perianth segments opening wide, style but slightly exserted and the stamens in a fascicle in the upper side of the throat. (b) *Loxanthocereus*

BB. Tube straight, heavy, cylindric.

1. Tube with a ring of cottony hairs in the throat above the nectary..... (c) *Borzicactus*

AA. Flowers not zygomorphic and usually enduring 24 hours or less.

C. Scales on fruit small, distant, and insignificant.

D. Tube narrowly funnelform.

- E. Plants upright, columnar, with bristles or hairs near the apex or down the stems.
 1. Flowers diurnal, small, rotate, with the outer segments much recurved. Flowers white to bright colored..... (d) *Peruvocereus*

EE. Plants arching to decumbent and without bristles or hairs.

1. Flowers nocturnal, medium large, salverform with the outer segments recurved. The known species have white or nearly white flowers..... (e) *Haageocereus (Binghamia)*

CC. Scales on fruit approximate to overlapping and very noticeable.

1. Scales broad and flattened.

DD. Tube broadly funnelform.

- EE. Plants upright, columnar with or without hairs or bristles.
 1. Flowers nocturnal, large, salverform, white (f) *Trichocereus*, Section *Typica*
 2. Scales narrow and elevated; thorn-like.

DD. Tube narrowly funnelform.

1. Flowers nocturnal, medium to small, salverform, pink to lavender..... (g) *Trichocereus*, Section *Parviflorae*

The long-lasting, usually red, zygomorphic flowers of the first group (*Cleistocactus*, *Loxanthocereus*, and *Borzicactus*) readily distinguish these genera from those included in the second group. A closer relationship exists between the genera *Cleistocactus* and *Loxanthocereus* than between *Loxanthocereus* and *Borzicactus*, but the nearly-closed, tubular flowers of the first genus distinguishes it from the other two.

Borzicacti are relatively large plants, usually arborescent, and the spines are few and coarse. The fruit is yellow and has large, flat scales; the tube of the *Borzicactus* is equidiametric, and the tuft of cottony hairs inside the throat is an excellent generic distinction.

The *Loxanthocerei* are decumbent to vining plants with many finer spines. The fruit bears minute, distant scales. They have by far the finest flowers of any of the three genera, and sometimes reach a diameter of nearly 4 inches.

Although usually red in color, a red-orange and a coral-flowered *Loxanthocereus* is known. Some of the red flowered species have an overcast of iridescent blue similar to that found in the flowers of the genus *Heliocephalus*. There are two distinct types of *Cleistocacti*: the best known being the base-branching kinds with their soft, berry-like fruit (*Cleistocactus Baumanii*); the other, little-known, Peruvian group forms many-branched trees, and the fruits are much drier and very scaly.

The second group of Peruvian cacti also contains three genera. (*Peruvocereus*, *Haageocereus*—"Binghamia," and *Trichocereus*). The oldest known genus is *Trichocereus*, but only one species in the section *parvifloras* was known until recent years. (*T. fascicularis*). Curt Backeburg added another, (*T. cephalomacrostibas*), and there are three other new species yet to be described. The tubes, ovaries, and fruit

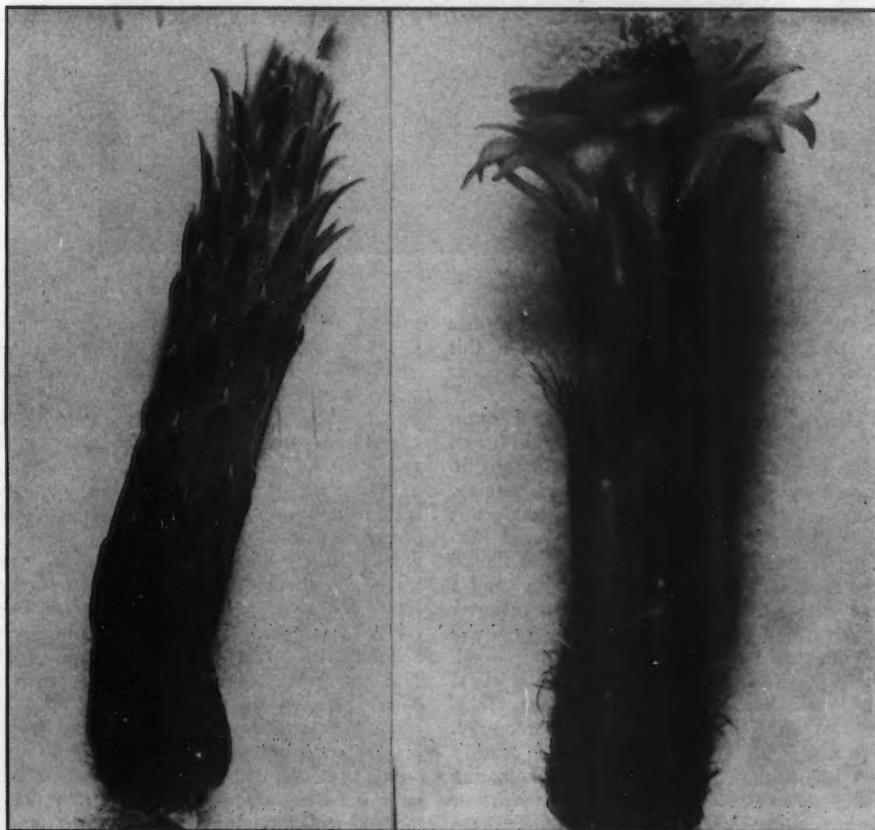


FIG. 96. LEFT: *Cleistocactus morawetzianus* var. *arboreus* from Mejorada, $\times 1.5$
RIGHT: *Borzicactus* species, $\times 1$



FIG. 97. *Binghamia* species from Atico, Peru, x 1.

of this section have many narrow, thorn-like scales. All the flowers so far observed in this section are nocturnal and pale pink or lavender in color.

Britton and Rose created the second genus, *Binghamia*, which has come under so much discussion. Backeburg changed the genus to *Haageocereus* and added some day-blooming, small, colored-flowered species. Formerly this genus had contained only larger-flowered, nocturnal species. I believe that this genus should be maintained in its original meaning, and I have erected the genus *Peruvocereus* to cover the small-flowered, diurnal, bristly or hairy Cerei which have been so little understood. These plants may also form apical or lateral pseudocephaliums and the flowers vary from green to white, pink, magenta, or crimson-red. This new genus contains many of the world's most beautiful Cerei due to the predominating white, yellow, golden, or red bristly hairs or spines.

The genus *Haageocereus* (*Binghamia*) contains two sections: (1) the arching group which

includes *H. acranthus* and its many varieties, and *H. olowinskianus*, and (2) the prostrate group which contains *H. decumbens* and many others. The first section is transitional to *Trichocereus*. The other group exhibits many fine lateral spines but seldom any evidence of bristles and is never hairy. An observant person can tell the plants apart at a glance even when they are not in flower. The night blooming flowers of the decumbent group of *Haageocereus* have medium large, showy flowers which are rarely fragrant as are many of the *Trichocerei*. *Haageocereus chosicensis* and *H. pacalaensis* are *Peruvocereus*, and these two species have been verified both by Mr. Harry Johnson and myself. The only real similarity in either growth or flower between the genera *Peruvocereus* and *Haageocereus* is in the fruits. Actually, the *Haageocereus* is much closer to the *Trichocereus* than they are to the *Peruvocereus*. This latter genus is undoubtedly a very new one as the different species have very narrow ranges. *H. acranthus*, on the other hand, has an immense altitude as well as geographical distribu-

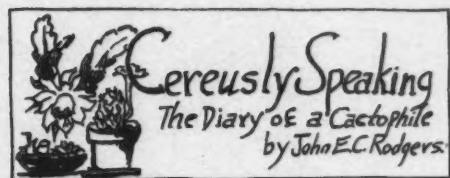


FIG. 98. *Trichocereus cephalomacrostibas* from Pampa de Caraveli, x 0.5



FIG. 99. *Peruvocereus clavatus*, x 0.75
x 0.75

tion on the western slope of the Andes. All the species in the above described six genera have been grown side-by-side in my garden in Lima, Peru, for nearly three years and maintained their good, generic distinctions under all conditions of soil and weather.



The genus *Parodia*, Spegazzini 1923, contains 21 species with varying characteristics: in some species (*P. maasii*, *P. aureicentra*, *P. schwebsiana*, etc.) the fruits remain in the freely produced wool in the tops of the plant like *Malacocarpus*; in others, the fruits bear the floral remains and are visible as in *Nicotriocactus*; some have hooked central spines (*P. aureispina*, *P. brasiliensis*, *P. carminata*, etc.); while in others the spines are straight (*P. faustiana*, *P. niveosa*). The plants are small with hairy and bristly flower tubes and small fruits.

The *Parodias* are not generally cultivated here in Ohio although one collector had 6 species as early as 1940. *Parodia aureispina* (the first one I saw in bloom) is known here as "Tom Thumb;" no doubt this local name became popular because our own super-salesman of cacti, Harry Johnson, has it in color in his catalogues. *P. sanguiniflora* has become the "Red Tom Thumb."

These beauties from South America begin budding in early April or May and bloom during June, July and August, for me, with an occasional bloom in September. They are easy to flower. R. W. Kelly in "Seedlings That Flower," Vol. IX, Cactus and Succulent Journal, pg. 142, states, "*Parodia aureispina* and *P. chrysacanthion* have bright yellow spines and bear golden flowers at an early age."

So far I have not lost one *Parodia* in the seven years I have been collecting this genus. Heavy soils induce rot as well as in other genera. Mealy bugs and spine bugs prefer other species of cacti, no doubt more to their taste, as I have "exposed" them to badly infested *Mammillaria* plants and only a very few migrate.

Parodias are native to northern Argentina and central Bolivia extending across Paraguay into southern Brazil which makes them a sub-tropical species. Marshall and Bock in "Cactaceae" state, "Many species have proved hardy at 20° F." No data is available in any other book I have read so far. Allied species are discussed by R. W. Poindexter, Vol. VIII of this JOURNAL, pgs. 155-161 regarding the California freeze of 1936-37, however. They grow mostly in open plains with scattered shrubs and long grasses for protection from sun. The rainfall is from 30 inches in Argentina and Bolivia and to 80 inches in Paraguay and southern Brazil from January to March in the southern limit and into June in the northern limit. The soils of these regions are rich in leaf mold with weathered rock and debris for underlaying drainage. Note: Returned friends say underlying drainage is a misnomer—it is a sea of mud if one gets mired. Corresponds most nearly to the "gumbo" of Northern Dakota which I have used with success for South West cacti.

Continued on pg. 135

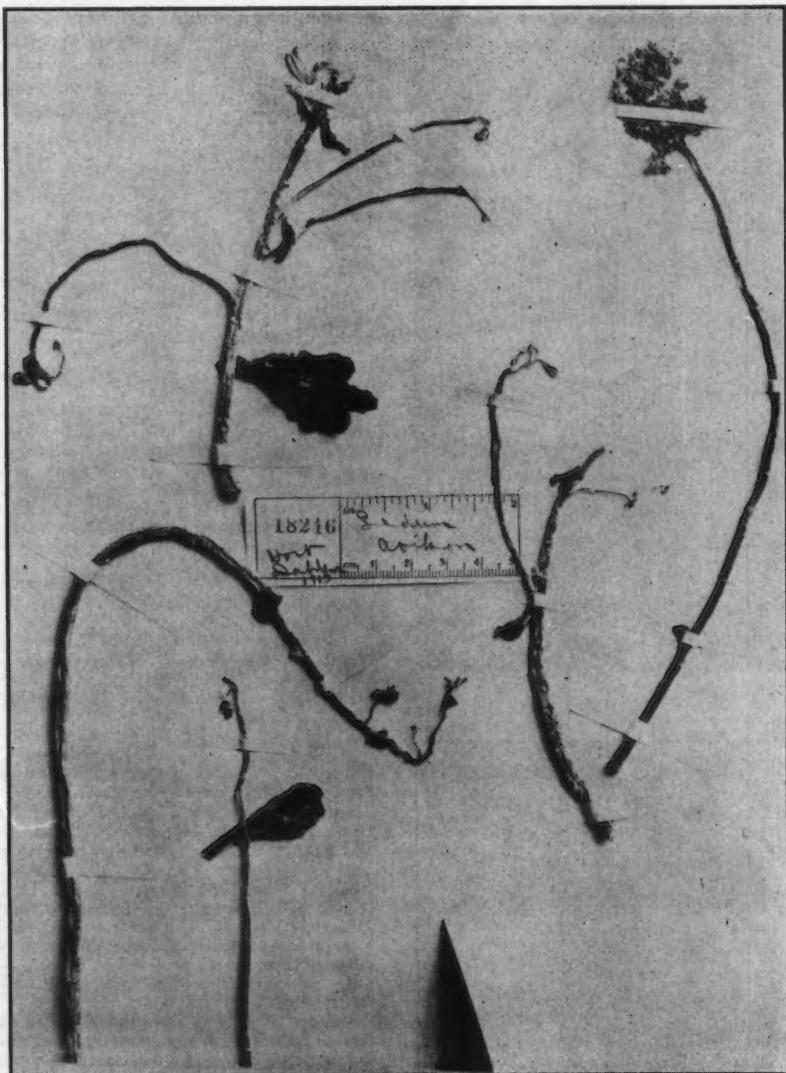


FIG. 100

Type specimen of *Sedum aoikon* Ulbrich in the herbarium at Berlin. Photo through the courtesy of the Chicago Natural History Museum.

STATUS OF *SEDUM AOIKON*

By ROBERT T. CLAUSEN

The German botanist, Ulbrich, described *Sedum aoikon* in 1917 in the *Notizblatt des K. Botanischen Gartens und Museums zu Berlin-Dahlem* 7:111. His description was based on a plant of unknown origin, cultivated for several years at the botanical garden in Berlin. This

flowered there in March and April. Since the original description probably is not available to most readers of the present discussion, a free translation of Ulbrich's Latin may be useful before the consideration of the status and relationships of the species.

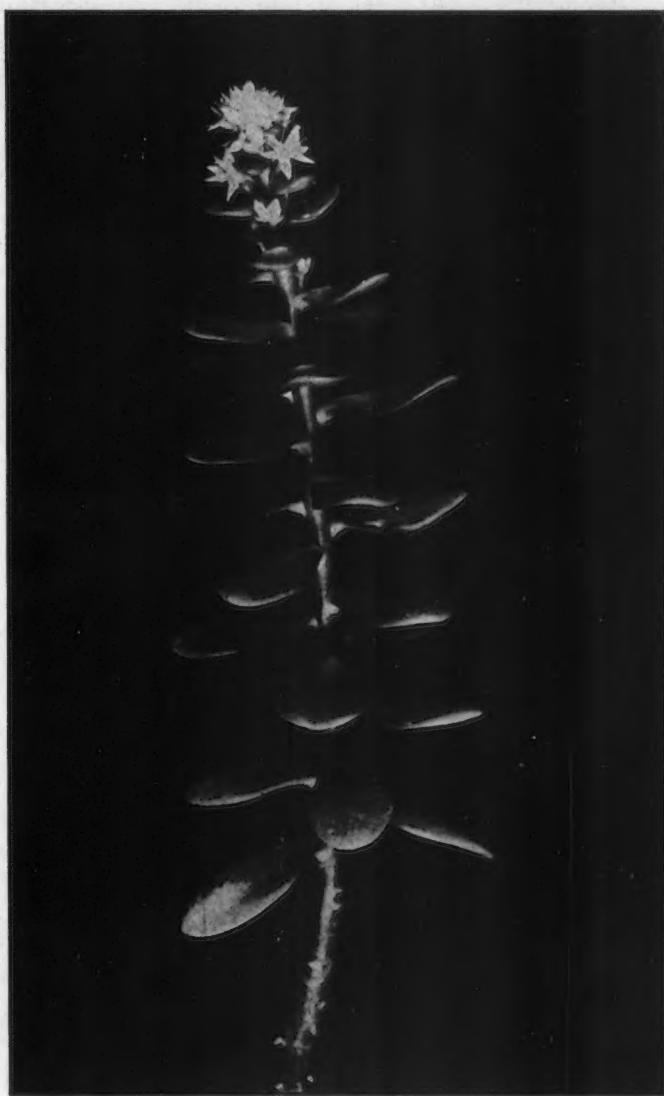


FIG. 101

Flowering specimen of *Sedum aoikon* cultivated in greenhouse at Ithaca, N. Y.
Photo by W. R. Fisher.

Ulbrich wrote that *Sedum aoikon* is a shrub to 1 meter high, sparingly branched, with the branches terete and smooth, the old ones to 1 cm. thick at the base covered with a very thick gray bark, the young ones flexuous, shiny and pinkish, leafy only at the apex. The leaves are obovate to spatulate, obtuse or subemarginate, to 4.5 cm. long, 2.5 cm. broad, and 3 mm. thick, smooth, shiny-green, either equally so on both

surfaces or slightly paler beneath, those of the floral stems obovate above, subspatulate below, those of the sterile stems spatulate and all caducous. The inflorescences which terminate the stems are many-flowered, dense, leafy and subglomerate-paniculate. The lowest branches of the inflorescences are up to 15 mm. long and arise in the axils of oval, sessile, thick leaves. The flowers are yellow, sessile, 5-merous, to 10

mm. in diameter, with the calyx divided almost to the base, with the lobes 1.5-2 mm. long, lanceolate to linear-lanceolate, obtusish, unequal, and the corolla with the petals yellow, canaliculate, lanceolate, acute, to 5 mm. long and 1-1.5 mm. wide. The stamens are 10, protandrous, much shorter than the carpels, scarcely 2-2.5 mm. long, abruptly attenuate in the uppermost third, with the anthers globose, yellow, about 0.2 mm. in diameter. The ovaries are 5, sessile, very glabrous, yellowish green, gradually narrowed into the styles, many-ovulate. The stigmas are puncticulate.

The relatives of *Sedum aoikon*, according to Ulbrich, are *S. dendroideum*, *S. oxypetalum*, *S. tuberculatum* and *S. praealtum*, all of which are native in Mexico. These all have larger, looser inflorescences than the compact, crowded cymes of *S. aoikon*. Although the nativity of his species was unknown, Ulbrich suggested that it might be Mexico, possibly because the most nearly related species occur there.

Praeger did not list *Sedum aoikon* in his "Account of the Genus Sedum as found in cultivation" in 1921 (Jour. Roy. Hort. Soc. 46). Fröderström (Act. Hort. Goth. vol. 10, app.: 10) listed the species with a brief paraphrased description, but said that it was unknown to him. In connection with my own investigation of *Sedum*, I have studied the original description, already translated above, but until recently

have been unable to interpret the name. In December, 1947, I had the opportunity to examine a photograph, at the Chicago Natural History Museum, of Uebrich's type. Whether or not the specimens depicted survived the recent war, I do not know. I suspect not. In any case, the photograph, reproduced here as fig. 1, may help to clarify the interpretation of the binomial.

When I described *Sedum luteoviride* (see Cactus and Succulent Journal 18: 74-77, 1946), I had not yet seen the photograph of Ulbrich's specimens, but I had reached the conclusion that *S. aoikon* and *S. luteoviride* were not the same. This conclusion is confirmed after study of the picture of the type of *S. aoikon*. My other conclusion, namely that the plant which was described and illustrated as *S. confusum* by Mrs. Rush in the Cactus Journal, vol. 8, p. 146-148 (1941), is *S. luteoviride*, is incorrect. Mrs. Rush kindly sent me cuttings of the plant which she discussed as *S. confusum* in her article. These have made good growth in the greenhouse here at Ithaca and flowered in early December, 1947. The floral and vegetative details compare well with Ulbrich's description, also the flowering plants appear to match his type of *S. aoikon*. In order to indicate my present understanding of the relationships of *S. aoikon* and some of its relatives, I have prepared a table contrasting what seem to be some of the diagnostic features.

	<i>Sedum aoikon</i>	<i>Sedum confusum</i>	<i>Sedum dendroideum</i>	<i>Sedum luteoviride</i>
Height	to 4.5 ("10") dm.	to 2.3 dm.	to 10 ("30") dm.	to 3.2 dm.
Length of leaf-bearing part of sterile stems	6-14 cm.	1-6 cm.	5-11 cm.	3-16 cm.
Leaves of sterile stems	not rosulate	rosulate	not rosulate	not rosulate
Apex of leaves	rounded, subapiculate	subemarginate	rounded, subapiculate	obtuse to subacute
Length of leaves	0.5-4.7 cm.	1.5-3.8 cm.	1-6.8 cm.	0.5-1.6 cm.
Width of leaves	3-18 ("25") mm.	8-14 mm.	13-20 mm.	3-6 mm.
Thickness of leaves	1.5-3 mm.	2-3 mm.	2-3 mm.	1-2 mm.
Relationships of age and length of leaves	oldest and lowermost the longest, but not evenly decreasing in length upwards, instead in zones of long and short leaves	oldest and lowermost the longest, decreasing in length upwards and towards centers of rosettes	oldest and lowermost the longest, decreasing in length upwards	irregular, long and short ones alternating in zones
Cymes	dense, congested	rather dense	usually open	open
Petals—shape	lanceolate	ovate-lanceolate	lanceolate	oblong-lanceolate
Petals—length	3.8-4 ("5") mm.	4 mm.	7 mm.	4-6 mm.
Stamens—length	('2"-) 3.2-3.6 mm.	2 mm.	4-5 mm.	2-4 mm.

As listed, the differences between these several species do not appear great. At present, I know nothing about megasporogenesis or breeding relationships of these plants. In cultivation, they are propagated vegetatively. In nature, a large amount of vegetative propagation must also occur. No evidence is available to indicate whether seeds which may be developed are of mictic or apomictic origin. For these reasons, the present classification may be unsound biologically, but the necessary data are not yet available to permit a satisfactory revision. *Sedum aoikon* has somewhat the appearance of a hybrid between *S. confusum* and *S. dendroides*. Flowers in the greenhouse at Ithaca, N.Y., withered after anthesis. No fruits with seeds developed.

The distinctions between *S. aoikon* and *S. confusum* are well shown by the illustrations in the article by Mrs. Rush already mentioned above. Some difference of opinion may exist concerning the interpretation of the photographs of the types of both *S. confusum* Hemsley and *S. aoikon* Ulrich. The inflorescences and leaves of the specimens designated as *S. confusum* by Hemsley impress me as different from those in Ulrich's specimen. Elongate, spatulate leaves, such as exhibited by the type specimen of *S. aoikon*, are frequent on stems of the plants which I identify as that, but are lacking in *S. confusum*. Likewise, the curving of the stems, lack of sterile rosettes and very short, inferior branches of the cymes all are characteristic features of *S. aoikon*.

The nativity of *S. aoikon* still remains uncertain. Further, with the change of identification of the plant described by Mrs. Rush, the origin of *S. luteoviride* also becomes more indefinite, for I had mentioned under that species Orizaba, in Mexico, as the place from which one of the plants had come. My comment about place of origin in the wild, previously made for *S. luteoviride*, must now be transferred to *S. aoikon*. One additional note may be added, however. In a letter dated April 17, 1946, Mrs. Rush said that her plant had been compared with one collected in Hidalgo by Mr. Walther. Some clues are thus available as to the possible source of *S. aoikon* in nature.

For supplying specimens useful in the preparation of this article, I wish to express appreciation both to Mrs. Ethel Rush and to Mr. J. R. Brown. Also I wish to acknowledge the support of my studies by the Trustee-Faculty Committee on Research of Cornell University.

Dept. of Botany
Cornell University

CEREUSLY SPEAKING

Continued from page 131

My culture methods are not ritualistic nor difficult to follow as I use a rich mold of decayed straw (from along a barnyard fence which contains the admixture of "churned" cow manure also) or maple leaf mold (non-acid). I mix about $\frac{1}{2}$ of this mixture with an equal amount of sand and gravel, a dash of slaked lime, or old plaster and a pinch of bone meal per pot. I use $2\frac{1}{2}$ inch pots which I set in a larger size to insure good drainage and uniform moisture at the roots. I water once a week in winter and whenever "dry" in summer (glasshouse culture). Moderate waterings at all times seem to suit them.

The flowers of all of the Parodias are colorful and plentiful. The plants are small (average 2 inches in diameter) when grown indoors either in the glasshouse or the window garden—this makes them ideal for limited space. Johnson Cactus Gardens lists 8 species in his 1948 list (catalogue 25c, Paramount, California) as being available for "general consumption." Other dealers list the most common ones.

My plant of the month is *Parodia mutabilis* named by Backeberg in 1934. In his "B. F. K." (available from Abbey Garden Press \$6.75) Backeberg shows a fine picture of this plant and 12 others. *P. mutabilis* comes from northern Argentina. It is clean looking with 50 white bristly spines surrounding 4 yellow to orange brown-tipped heavy spines, one of which is hooked. This plant likes full sun in the morning and afternoon. Will tolerate light shade, in fact any one of my Parodias have to thrive on less sunlight as we only get 120 days average here around the Great Lakes. The soil is well drained loam into which I have worked well-dried chicken manure (am too lazy to repot more often than every four years) lightly into the top surface of the soil (roots are not surface feeders, either, but I want to be safe) during the growing season—February to late September for me. Blooms open a golden yellow with a darker reddish orange throat. Rather small at first but grow larger



FIG. 102. *Hickenia microsperma* (Br. & R.) is now called *Parodia microsperma*. Plate XXIII of *The Cactaceae* shows this in color.

when they open the second day. Flowers fade slightly in full sun; they close at night for 3 to 5 days for most species if air is not too dry or too high humidity. The flowers stay partly open before closing for good. They set seed if early evening insects get to the flowers before sunset. Self fertile but not too

many seeds germinate. My plant is 2 inches high by 2½ inches in diameter and produces 20 to 50 flowers per season which is the reason I have selected it as the plant of the month.

Next month Pleiospilos with *P. nelii* as the "P of the M."



FIG. 103. *Trichocereus Spachianus*: six feet tall growing in the Editor's garden in Pasadena, California. This plant produced twenty-five 12-inch flowers on July 4th and 5th. See cover illustration.

GRAFTING CACTI

By ROBERT BLOSSFELD

Part II. Continued from page 104

SELECTION AND CULTIVATION OF STOCKS

Though there seems to be no limit to which the species and genera of cacti will unite, experience has shown that some species are especially well fitted for certain purposes. One grower recommends the use of a stock coming from cool regions for plants from tropical climates. However, no general rule can be given for the selection of a stock plant. Only two points are essential: *The stock plant shall supply just as much food as the scion is able to assimilate and it should have the same growing and resting periods as the scion.* Only in this case is a continuous sound growth of both portions secured and the scion will keep its characteristic

appearance. One exception of this rule is practised with temporary intermediate graftings on a very soft, fleshy stock for the purpose of recovery and recuperation of the scion or in order to secure a very vigorous growth of young seedlings for a limited time. The following list with description of the qualities of several good stocks may be a guide to the selection.

I. VIGOROUS, JUICY STOCKS FOR TEMPORARY GRAFTS

Opuntia robusta, *O. ficus indica*, *O. nopalae*, *O. tomentosa*, *O. cylindrica* (the latter cannot stand much moisture together with low temperature in winter) and some other species of *Opuntia* which do not shrivel during the winter

and which give a good large cut surface for the scion, are well fitted and induce the most rapid growth of the scion. But they are generally spent in the first year. One branch of *Chamaecereus Silvestrii* divided into halves and grafted on a strong plant of *Opuntia* produced thirty-five thick new branches in one year. But in the following winter the *Opuntia* was spent, the weight of the enormous head bowed it over and it died. *Opuntias* are sometimes also used for *Rebutias* in order to have these in flower twice a year, and for grafting seedlings.

Seedlings of *Echinopsis* are good temporary stocks for other seedlings, e.g. one small seedling of *Cephalocereus senilis* (Old man) three months old, grafted on an *Echinopsis* seedling grew to walnut size within one year. They are also suitable for the recovery of larger globular cacti giving a large surface for the union. Sprouting or offsets may be restricted by cutting away the areoles together with the spines. The above species are mainly used as a nursing stock and are not suitable for permanent graftings, except perhaps for species (cristates) of the same genus.

II. EASY GROWING STOCKS WHICH KEEP WELL

Trichocereus Spachianus. The most favoured stock of medium sized diameter, rich in juice, becoming woody only when very old. A stock suited to nearly all species. It easily makes branches at the base which must be removed when they are about $\frac{1}{2}$ in. long. These cuttings are rooted and grown on for propagation. *T. Spachianus* is readily grown from seed and likes a rather nutritious soil. The only disadvantage is that the green color easily turns blackish-brown, beginning at the areoles. In order to prevent this it is advisable to keep the stock plant always in active growth and to water from time to time with weak liquid cow manure.

Trichocereus macrogonus. A fine bluish colored species with a very good root system securing vigorous growth of the scion, resistant to red spider and rot. Recommended for *Mammillarias*, *Echinocerei*, *Chamaecereus*, *cristates*, etc. Sometimes the scion does not unite or only at one side so the rubber rings should be left for a week or so on the fresh graft. The stock plants must be in full growing condition at the time of grafting, otherwise they will be sapless in a few days.

Trichocereus lamprochlorus. A soft, juicy, robust, thick growing, very resistant species. The best stock for delicate soft scions coming from warm regions, like *Echinocereus*, *Pilocereus Guentheri*, *P. Palmeri*, *P. Sartorianus*, *P. chrysanthus*, *P. Collinsii*, etc. (The perfectly white-haired species of *Pilocereus* and *Cephalocereus* are better grafted on *T. Spachianus*.)

Lemaireocereus marginatus. A good stock for

Rebutias and *Lobivias* and many other species. *Echinocereus Knippelianus* reached three to four times its original size within one year on this stock. The sap contains acid and quickly turns black and very sticky on the fresh cut surface. Therefore the scion should be cut first and a rustproof knife used which does not become tarnished with acid. The branches or shoots must be detached before they grow too large.

Harrisia Jusbertii. A much favored slender stock for seedlings and especially for *Rebutias* and *Lobivias*, *cristates* and thin species of *Pilocereus*. Even graftings of *Mesembryanthemum* (*Lithops*) succeeded on this stock, which is, of course, an interesting curiosity, but of no practical value. *Harrisia Jusbertii* is not very spiny and can be handled easily. As a stock plant it keeps well for decades. It is easily propagated from cuttings. But even three year old branches turn woody at the base, which makes them worthless for short grafts. If, however, the soft growing tip is cut away early in the year and rooted, the woody stem of the mother plant will branch very freely and numerous young soft cuttings may be detached for further grafting purposes.

Mediocactus coccineus. Being of much more slender habit this is especially suitable for grafting seedlings and, as it keeps very well, it may generally be left as the permanent stock. It is of very robust growth and branches freely.

Most species of *Piptanthocereus Berger* (*Cereus lepidotus*, *jamacaru*, *peruvianus*, *alacriportanus*, *Hankeanus*, *stenogonus*, *chalybaeus*, *azureus*, *coeruleascens*) which belong to the very quickest growing of the columnar cacti, are good stocks for grafting, especially as seedlings, for grafting other small seedlings. They like a warm, sunny place in summer and can be grown rather cool and dry in winter. The soil should be nutritious but well drained like that for *Opuntias*. All species are easily propagated from seed or cuttings.

Trichocereus Schickendantzii is often used instead of *T. Spachianus* as a rather thick stock. The following species are best for tall grafts: *Lemaireocereus stellatus*, *Nyctocereus serpentinus*, *Selenicereus hamatus*, *S. Boeckmannii*, *S. grandiflorus*, *S. McDonaldiae* for grafting *Aporocactus flagelliformis*, *A. flagriformis*, *Zygocactus*—the Christmas Cactus, *Rhipsalis*, etc., and *Peregrina aculeata*, *P. discolor* and *Epiphyllum* for grafting *Zygocactus* and *Rhipsalis*. Some of these are weak-stemmed and cannot be used for tall grafts unless supported by a stake. Such tall grafts of bushy plants as *A. flagelliformis* or *Zygocactus* branch and bloom very freely and with proper care a very charming plant can be obtained. *Rhipsalis* and others are also very decorative plants for hanging baskets. For this purpose they should first be

grafted on a *Peireskia* about 11 to 15 in. high. If the scion has become a fine bushy plant, the stock may be cut back to about 4 in. and rooted again and planted into the hanging basket. The roots form very quickly in summer. Among other succulents, robust branches of *Stapelia* are occasionally used as stock for *Trichocaulon*, *Hoodia*, *Tavaresia*, etc. The sap of these succulents should be dried somewhat before the portions are united, otherwise the cut surfaces slip apart.

For the successful cultivation of *Rebutias*, which are now coming into great favor owing to their beautiful flowers, it is essential to give them a resting period in winter, when they form the flower-buds. Then they need very little moisture and should be kept at an average temperature of 40 to 43 degrees F., giving as much light as possible. These dwarf cacti will flourish best when they are grafted. For propagation purposes nurserymen use preferably *Trichocereus Spachianus* or *macrogonus* as stock-plant which should be rather tall. They induce a vigorous and sound growth, and if the top of the section is cut away, practically all areoles will form new sprouts which soon grow up to large clusters under which the original scion disappears. All these growths can be detached and grafted on the following stock-species which secure besides a healthy growth also a great profusion of blooms: *Cereus Daymii*, *formosus*, *peruvianus*, etc. Practically all species of *Trichocereus* coming from cooler climate, also *T. pasacana* and *Lemaireocereus marginatus* as well as the common robust growing *Echinopsis* are suitable stocks for *Rebutias*, whilst *Opuntias* should only be used as temporary nurse-stock.

CULTIVATION OF STOCK PLANTS

Some cactus growers place their plants in damp, close glasshouses with bottom heat. This treatment induces a most vigorous growth, but after some months or in our winter the more delicate varieties damp off or are infected by diseases as they are grown too weak. Generally such plants lose their characteristic appearance and color and the cells are so soft and so saturated with water that infecting germs enter easily, and from there the disease rapidly penetrates the whole plant. Though the species named as stock plants are more robust growing and would stand that treatment, yet their tissues are grown too quickly and have not the necessary firm texture for grafting. On the other hand, if the plants are grown too dry in poor soil the body turns woody and the scion would not receive enough food. A treatment securing quick, sound, growth and dark green color for the plants, a firm texture of the flesh and especially a good strong root system is best. The

plants must be grown in as much light as possible and the house well ventilated during the hot season. Only a week or so before the stock plants are used for grafting, they must be placed in a rather hot, damp, close room in order to have them in active growing condition and full of sap for grafting. Some easy growing varieties of *Opuntia*, *Echinopsis* and *Cereus* may receive in their growing period a weak solution of liquid cow manure in order to strengthen them for their heavy task. But in general cacti should not be given manure.

REMARKS ON CULTIVATION OF CACTI

The soil should consist of two parts of well rotted leaf mould, one part of coarse sand and one smaller part of matured loam mixed with carbonate of lime from old walls and perhaps charcoal dust which prevents rot. *Opuntias*, *Coryphanthas* and most varieties with a thick, turnip-shaped root like more loam in the soil, whilst other species which are more or less covered with white hair or wool generally want more lime. Good drainage should be secured by a layer of crocks or other coarse material at the bottom of the pots. Permanent out-of-door plantings in warmer climates should be placed where the ground slopes sufficiently. Otherwise a perfect drainage must be insured by a system of drainage tiles and abundant addition of gravel and coarse sand to the soil. In order to prevent the roots from drying off, the soil must be kept slightly moist at all times, but it is essential that a thorough drainage prevents constant saturation. When the growing activity is decreased by natural climate conditions, the water supply must be reduced accordingly, for cacti and other succulent plants cannot stand much moisture in the cold season. In a northern climate cacti should be given a resting period in winter with reduced watering; they should be kept rather cool, but as light as possible and just moist enough to keep the roots alive. If the pots are embedded in moist sand near a window in a cool chamber or even in a light cellar, they will stand the winter very well. Many varieties (*Rebutia*, *Lobivia*, *Echinopsis*, etc.) are preparing their buds in the resting period and will not bloom if they are kept in constant growth in a hot house during the winter.

Early in spring they are best planted out in a hot bed, where they must be shaded at first. Then they will at once start to grow wonderfully and flower profusely. The plants may remain there, well ventilated during the summer and well hardened off in autumn. They should be potted up by August and the pots embedded in the soil so that they are pot-bound in late autumn, when the danger of frost makes it necessary to bring them into the conservatory.



SPINE CHATS

LADISLAUS CUTAK



Aloe rubrolutea from Southwest Africa makes a very ornamental greenhouse plant. We have three of these plants on exhibition in our South African Room and they are some of the first succulents that I raised from seed. The particular species in this month's discussion is a seedling dating back to the year 1929. Aloes are special pets of mine because most of the species grow easily, propagate readily, and bloom regularly each year. They prefer a fairly rich porous soil and a sunny location.

In its native habitat *Aloe rubrolutea* is said to attain a height of eight feet or more and then is covered with old withered leaves like some of our Southwestern Yuccas. The species possesses a stout stem and bears a crown of swordshaped or broadly lanceolate-elongate leaves at least 18 inches long. The widest ones are 4½ inches broad below the middle, thick and fleshy, glaucous green in color. The leaves are flat at the base but become channelled toward the tip. They have a peculiar way of extending horizontally from the stem and abruptly curving upward like the arms of a candelabrum. Conspicuous elliptic, whitish green spots appear in dense masses on the underside of the leaves and also on the flattened upper surface but in age gradually disappear as the plants grow larger. The leaf margins are beset with chocolate-colored spines which are often more or less hooked. The flowerstalk is much branched, the branches somewhat spreading, the racemes about a foot long and bearing many lax, drooping flowers. The immature greenish buds in the upper portion are erect and so organized that they remind one of a neat slender braid. As they begin to turn pinkish they start to spread and finally droop when ripe. At first the small, roughly obovate floral bracts are imbricate, greenish, tinged salmon and marked by purplish lines through the center but later become creamish, papery and more or less reflexed, 12 mm. long. Individual flowers, including the short pedicel and exerted stamens, average 4.5 cm. long. The perianth is straight, cylindric and somewhat flattened toward the apex. Sepals are linear-lanceolate, acute, with a peach red or nearly scarlet stripe (composed of lines) running through the middle. Petals are more elliptic in outline, whitish with a narrow orange or salmon-orange stripe through the center and an obtuse garnet brown tip. Stamens possess white filaments, scarlet orange anthers and are 3.5 cm. long. The style is shorter, about 2.6 cm. long, of a pale yellow color. Ovary is cylindrical, deep green. At Shaw's Garden, *Aloe rubrolutea* always blooms during the last week in July and the flowerstalks rise five feet above the crown of leaves. It is a sturdy plant and would make an excellent border plant in frostless regions.

* * *

Acanthocereus sicariguensis is a new species of cactus growing in Venezuela. It is described by Leon Croizat and Francisco Tamayo in the current Boletin de la Sociedad Venezolana de Ciencias Naturales (11:75-78, Oct.-Dec. 1947). It is a terrestrial cactus, up to 2 meters long and grows on the slopes of rocky Sicarigua hills in the state of Lara. Stems are 2-5 winged, with margins of ribs dentate-undulate, the

areoles 2 cm. apart. Spines are delicately pungent, grey-white, including 1-3 porrect or subporrect centrals and 5-7 radials, up to 2 cm. long. Flowers, when fully opened, are said to be 6-8 cm. broad and 16 cm. long, white flushed pink at apex in some of the inner perianth-segments. It is allied to the pan-tropic *A. pentagonus*.

* * *

MONA ISLAND, politically part of Puerto Rico, is approximately 6 miles long and 5 miles wide with a total area of about 14,000 acres. The island is relatively flat, with an average elevation of 150 to 175 feet above sea level. The island is surrounded by a coral reef, so complete, that landing a boat is always dangerous, very difficult and almost impossible during certain months of the year. The surface consists of two sharply divided levels: the coastal plain and the limestone plateau. The latter comprises the greatest portion of the area of the island, or more than 13,000 acres. A striking character of MONA is the fact that it is honeycombed with numerous caves and caverns, some of considerable size. The plateau is almost completely covered with an open forest of shrubs and low trees of a considerable number of species. Several species of cacti inhabit it and show abundant growth at some places. The snowy cactus, *Mammillaria nivosa*, a species which does not occur in Puerto Rico, is plentiful. *Cephalocereus Royenii*, several species of *Opuntia*, including *O. Dillenii*, and *Melocactus intortus* are also common. J. A. Ramos made a study of the insects of Mona Island and recorded a total of 526 species. The list can be found in the January, 1946, number of the Journal of Agriculture of the University of Puerto Rico.

* * *

Lex Fuaux is one of Australia's best known cactus personalities, hence I'd like to introduce him to our American and European readers. He is editor of the recently launched SPINE, quarterly magazine sponsored by the Cactus and Succulent Society of Australia. About eight years ago he was smitten with cactiphobia, thanks to a dear sister-in-law, and in the intervening years has gathered together some 1500 cacti and numerous other succulents, which is a fair effort in a country which has imposed total ban on the importation of cacti. When asked what were his favorites, he replied "All of them, but I lean toward the Haageocerei." His new home at Rosanna, which is a few miles out of Melbourne, is situated high on a hillside and clear of shadows, so that his plants will catch the full sun at all times. He has a 20 x 16 ft. greenhouse erected on top of his workshop. At his present location he also intends to establish a garden of native Australian plants. His father used to be a Logging Boss in the Canadian Rockies for many years, then established a large nursery business in Ipswich, England, exporting cut flowers to the Continent. Later he migrated to Australia, where young Lex was born and trained as an artist. In 1942 Lex went "Overland" through two thousand miles of Australia's inland—to war duty in the Gulf Country—and in free moments made collections of herbarium material. It was the beginning of his botanical work which he hopes to continue for his avocation.

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BOOK NOTES

NEW AND RARE SUCCULENTS — H. Krainz, president of the Swiss Cactus Society. Written in the German language, this booklet describes 9 new species or varieties of cacti, besides remarks and descriptions of many already published. 37 excellent photographs are reproduced. Printed on fine quality paper. \$1.00 postpaid in U.S., foreign please add 10c.

PLANT HUNTERS IN THE ANDES — T. Harper Goodspeed. An exceptionally well written account and excellent photographs of cacti encountered in the Andes. 429 pages of text and 77 pages of illustrations. \$5.00. Postage in U.S.A. 10c, foreign 35c.

Cactaceae — Marshall and Bock: We have a few slightly used copies of this out-of-print edition available at \$6 while they last. Please add 30c postage. This book has recently sold for \$15.00.

Cactus and Succulent Plants — H. M. Roan, England. This 1948 book of 60 pages is written for the amateur and contains many references to cacti and the other succulents, also growing methods, propagation, and month to month treatment. 112 illustrations. We are ordering these books from the National Cactus and Succulent Society of England and now is the time to obtain a copy for \$1.75 postpaid.

Horticultural Colour Chart of the Royal Horticultural Society of England, is again available. This is the generally accepted standard for color descriptions and is absolutely necessary in describing flowers. Price of the two loose-leaf volumes, \$10.50 for the next 90 days only. Foreign 11.00.

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FROM ENGLAND

I have been a subscriber to the JOURNAL since the beginning of 1945, although my interest in succulent plants goes back to some years before the war. About once a year I go through my file of JOURNALS right from the beginning and it is amazing how many interesting points I pick up with each re-reading. This is largely due to the fact that although my main interest is in the succulent Euphorbias I have also a good general collection of cacti and succulents (say 500 species in all) and as I add a few plants of a new genus from time to time, an article or even a small paragraph that might have been of slight interest a few years ago now possesses a new significance.

ALAN D. WHITEHEAD.

